

Appl. No. 10/782,545
Amdt. Dated July 26, 2005

Attorney Docket No.: NSL-025
Reply to Office Action of May 25, 2005

COMPLETE LISTING OF ALL CLAIMS

Kindly cancel claim 1, amend claims 2, 22 and 25-33 and add new claim 34 as shown in the listing of claims below. This listing of claims will replace all prior versions, and listings of claims in the application.

- 1 1. (cancel)
- 1 2. (currently amended) ~~The method of claim 1~~ A method for treating a substrate surface,
2 comprising the steps of:
3 coiling one or more substrates into one or more coils in such a way that adjacent turns of the
4 coils do not touch one another;
5 placing the one or more coiled substrates in a treatment chamber; and
6 in the treatment chamber, treating substantially an entire surface of the one or more coiled
7 substrates with a surface treatment process, wherein the surface treatment process includes
8 one or more atomic layer deposition (ALD) reactions.
- 1 3. (original) The method of claim 2 wherein the one or more ALD reactions include exposing
2 the surface of the coiled substrate to a reactant vapor of the type MCl_x , where M is a metal
3 and x is an integer from one to four.
- 1 4. (original) The method of claim 3, wherein the one or more ALD reactions include exposing
2 the surface of the coiled substrate to water vapor.
- 1 5. The method of claim 3 wherein MCl_x is $TiCl_4$.
- 1 6. (withdrawn) The method of claim 1 wherein the surface treatment process includes
2 anodization.
- 1 7. (withdrawn) The method of claim 1 wherein the surface treatment process includes drying.
- 1 8. (withdrawn) The method of claim 1 wherein the surface treatment process includes
2 annealing.
- 1 9. (withdrawn) The method of claim 1 wherein the surface treatment process includes exposure
2 to reactive gas or vapor.
- 1 10. (withdrawn) The method of claim 9 wherein the exposure to reactive gas or vapor includes
2 selenization.
- 1 11. (withdrawn) The method of claim 1 where the surface treatment includes anodization.

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- 1 12. (withdrawn) The method of claim 1 where the surface treatment includes electrodeposition.
- 1 13. (withdrawn) The method of claim 1 where the surface treatment includes electropolishing.
- 1 14. (currently amended) The method of claim [[1]] 2 wherein coiling the substrate includes
2 attaching an end of a roll of substrate material to a carousel, rotating the carousel while
3 unrolling the substrate material from the roll to coil the substrate around the carousel, and
4 placing one or more spacers between adjacent layers of the coiled substrate before the
5 carousel completes a turn.
- 1 15. (original) The method of claim 14 wherein each spacer touches a back surface of the
2 substrate but not a front surface of the substrate.
- 1 16. (original) The method of claim 14 wherein placing one or more spacers includes stacking one
2 or more spacers on top of one another.
- 1 17. (currently amended) The method of claim [[1]] 2 wherein coiling the substrate includes
2 attaching an end of a roll of substrate material to a carousel, moving the roll of substrate
3 material around the carousel while unrolling the substrate material from the roll to coil the
4 substrate around the carousel, and placing spacers between adjacent layers of the coiled
5 substrate before the roll completes a turn about the carousel.
- 1 18. (currently amended) The method of claim [[1]] 2 wherein the one or more substrates include
2 two or more substrates coiled side-by-side on a carousel.
- 1 19. (currently amended) The method of claim [[1]] 2 wherein coiling one or more substrates into
2 one or more coils in such a way that adjacent turns of the coils do not touch one another
3 includes placing a spacer tape between adjacent turns of the substrate.
- 1 20. (original) The method of claim 19 wherein the spacer tape is orientated substantially parallel
2 to a length of the substrate.
- 1 21. (original) The method of claim 19 wherein the spacer tape includes one or more passages
2 running substantially along a width of the spacer tape.
- 1 22. (currently amended) ~~The method of claim 1~~ A method for treating a substrate surface,
2 comprising the steps of:
3 coiling one or more substrates into one or more coils in such a way that adjacent turns of the
4 coils do not touch one another;

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5 placing the one or more coiled substrates in a treatment chamber; and
6 in the treatment chamber, treating substantially an entire surface of the one or more coiled
7 substrates with a surface treatment process,
8 wherein coiling one or more substrates includes attaching two substrates together back-to-
9 back to form a dual substrate and coiling the dual substrate.

1 23. (original) The method of claim 22, further comprising separating the two substrates after they
2 have been treated in the treatment chamber.

1 24. (withdrawn) A substrate surface treatment system, comprising:
2 a surface treatment chamber;
3 a carousel adapted to receive a flexible substrate material as a coil, the carousel being sized
4 to be received within the chamber with the substrate material coiled around the carousel in
5 one or more turns;
6 a winding mechanism configured to coil the substrate material about the carousel to form a
7 coiled substrate; and
8 one or more spacers, the spacers being configured to space apart adjacent turns of the coiled
9 substrate in such a way that the adjacent turns of the coiled substrate do not touch one
10 another; and
11 a mechanism adapted to place one or more of the spacers between adjacent layers of the
12 coiled substrate before the winding mechanism winds a full turn of the substrate material
13 about the carousel.

1 25. (withdrawn, currently amended) The system of claim [[22]] 24, further comprising one or
2 more sources of reactant gas coupled to the chamber, the reactant gas being of a type suitable
3 for performing atomic layer deposition.

1 26. (withdrawn, currently amended) The system of claim [[22]] 24, wherein the chamber is an
2 anodization chamber.

1 27. (withdrawn, currently amended) The system of claim [[22]] 24, wherein the carousel is in the
2 shape of a polygonal cylinder.

1 28. (withdrawn, currently amended) The system of claim [[25]] 27 wherein the carousel is in the
2 shape of a hexagonal cylinder.

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- 1 29. (withdrawn, currently amended) The system of claim ~~[[22]]~~ 24 wherein the spacers can be
2 secured in place with respect to the carousel.
- 1 30. (withdrawn, currently amended) The system of claim ~~[[22]]~~ 24 wherein the spacers can stack
2 on top of one another.
- 1 31. (withdrawn, currently amended) The system of claim ~~[[22]]~~ 24, wherein the spacers include
2 one or more spacer tapes.
- 1 32. (withdrawn, currently amended) The system of claim ~~[[29]]~~ 31 wherein the spacer tapes run
2 substantially parallel to a length of the substrate.
- 1 33. (withdrawn, currently amended) The system of claim ~~[[29]]~~ 31 wherein at least one spacer
2 tapes is located proximate a side of the substrate.
- 1 34. (new) An apparatus for treating a substrate surface, comprising:
2 means for coiling one or more substrates into one or more coils in such a way that adjacent
3 turns of the coils do not touch one another;
4 treatment chamber means; and
5 means for treating in the treatment chamber substantially an entire surface of the one or more
6 coiled substrates with a surface treatment process,
7 wherein the surface treatment process includes one or more atomic layer deposition (ALD)
8 reactions.